

GENERAL DESIGN GUIDELINES

PAGE 21-1 - STREET LIGHTING ALTERATIONS

- 1 SHOW PROPOSED LIGHTING LAYOUT, ON LARGER PROJECTS SHOW REMOVAL ITEMS ON SEPARATE REMOVAL SHEET.
- 2 SHOW EXISTING LIGHTING AND REMOVAL IF APPLICABLE.
- 3 LEGEND OF ELECTRICAL ITEMS.
- 4 GENERAL ELECTRICAL NOTES.
- 5 QUANTITIES THIS SHEET.

PAGE 21-2 - LIGHT STANDARD DETAILS

PAGE 21-3 - ELECTRIC HANDHOLE DETAILS

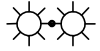
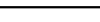




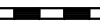
REVIEW STANDARD DETAILS AND NOTES TO MAKE SURE ALL ITEMS SHOWN ARE APPLICABLE TO THE PROJECT.

NOTE: SEPARATE SHEETS FOR REMOVAL AND TEMPORARY LIGHTING ARE REQUIRED WHEN REPLACING EXISTING LIGHTING.
FOR QUESTIONS REGARDING LIGHTING PLANS CONTACT DESIGN SUPPORT AREA - ELECTRICAL UTILITIES UNIT.

FINAL R.O.W.			
AUTH	DATE	NO.	REVISION

3

LEGEND

	EXISTING STREET LIGHTING UNIT
	PROPOSED FIBERGLASS CONDUIT
	EXISTING CONDUIT
	LIGHT STANDARD WITH 12' ARM ON FOUNDATION & FRANGIBLE TRANSFORMER BASE
	1-3" DIRECTIONAL BURIAL CONDUIT
	HANDHOLE
	CONDUIT, DIRECTIONAL BORE, 3"

4

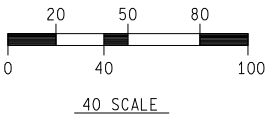
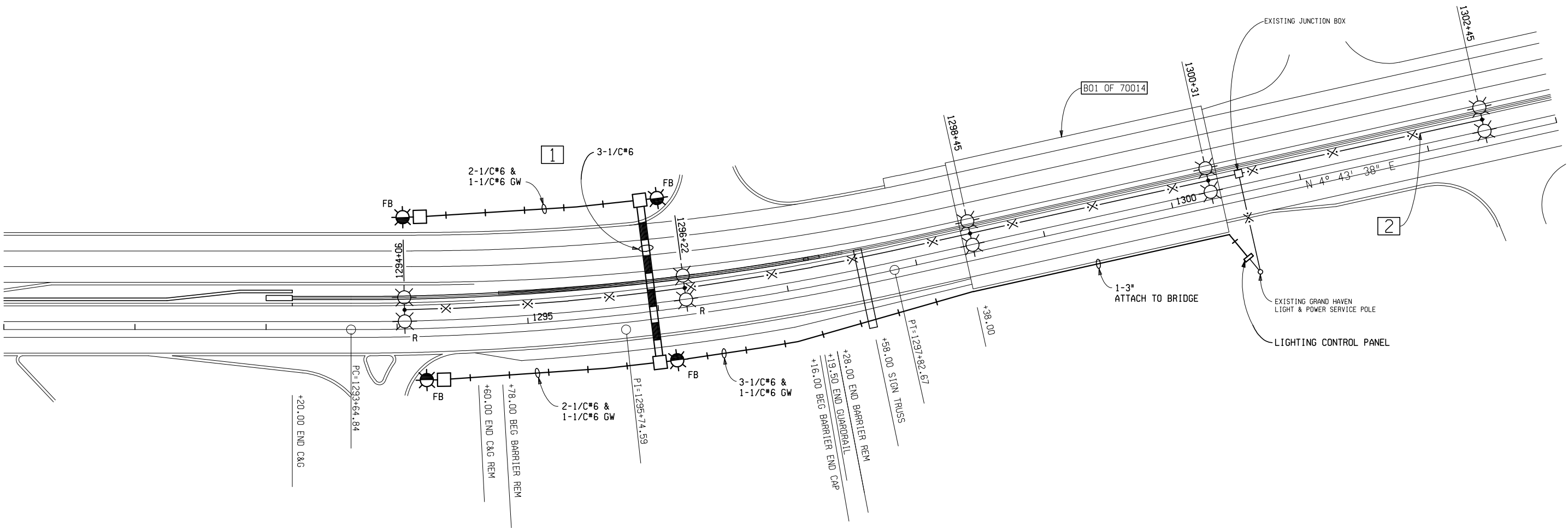
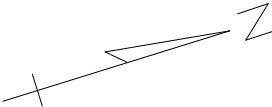
NOTES

1. THE SYSTEM OPERATING ENGINEER (GRAND HAVEN LIGHT & POWER) SHALL BE NOTIFIED 48 HOURS PRIOR TO WORKING ON LIGHTING CIRCUITS.
2. HIGH PRESSURE SODIUM LUMINAIRE SHALL BE MEDIUM DISTRIBUTION IES, TYPE III SEMI-CUTOFF.
3. THE EXISTING LIGHTING SHALL BE IN OPERATION DURING CONSTRUCTION. ANY DAMAGES TO THE LIGHTING OR TRAFFIC SIGNAL SYSTEM CAUSED BY THE CONTRACTOR SHALL BE REPAIRED AT THE CONTRACTOR'S OWN EXPENSE, WITHIN A REASONABLE TIME, AS DIRECTED BY THE ENGINEER.
4. 250W HPS LUMINAIRE SHALL BE EQUIPPED WITH REGULATOR TYPE BALLAST FOR 120V OPERATION.
5. LIGHT STANDARD SHALL BE ALUMINUM OR GALVANIZED STEEL.

5

QUANTITIES THIS SHEET

140 Ft	Conduit, Directional Bore, 3 inch
605 Ft	Conduit, Schedule 40, 3 inch
200 Ft	Conduit, Fiberglass, 3 inch, Structure
2475 Ft	DB Cable, in Conduit, 600V, 1/C#6
945 Ft	Cable, Equipment Grounding Wire, 1/C#6
5 Ea	Hh, Heavy Duty Cover
4 Ea	Light Std Fdn
4 Ea	Light Std, Frangible Transformer Base
4 Ea	Light Std Arm, 12 foot
4 Ea	Light Std Shaft, 30 foot or less
4 Ea	Luminaire, 250W High Pressure Sodium
1 Ea	Lighting Control Panel
1 Ea	Wood Pole, Fit Up, Sec Serv Pole

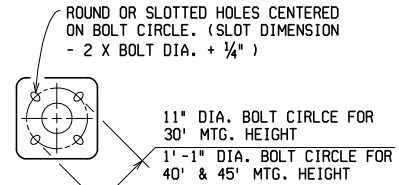
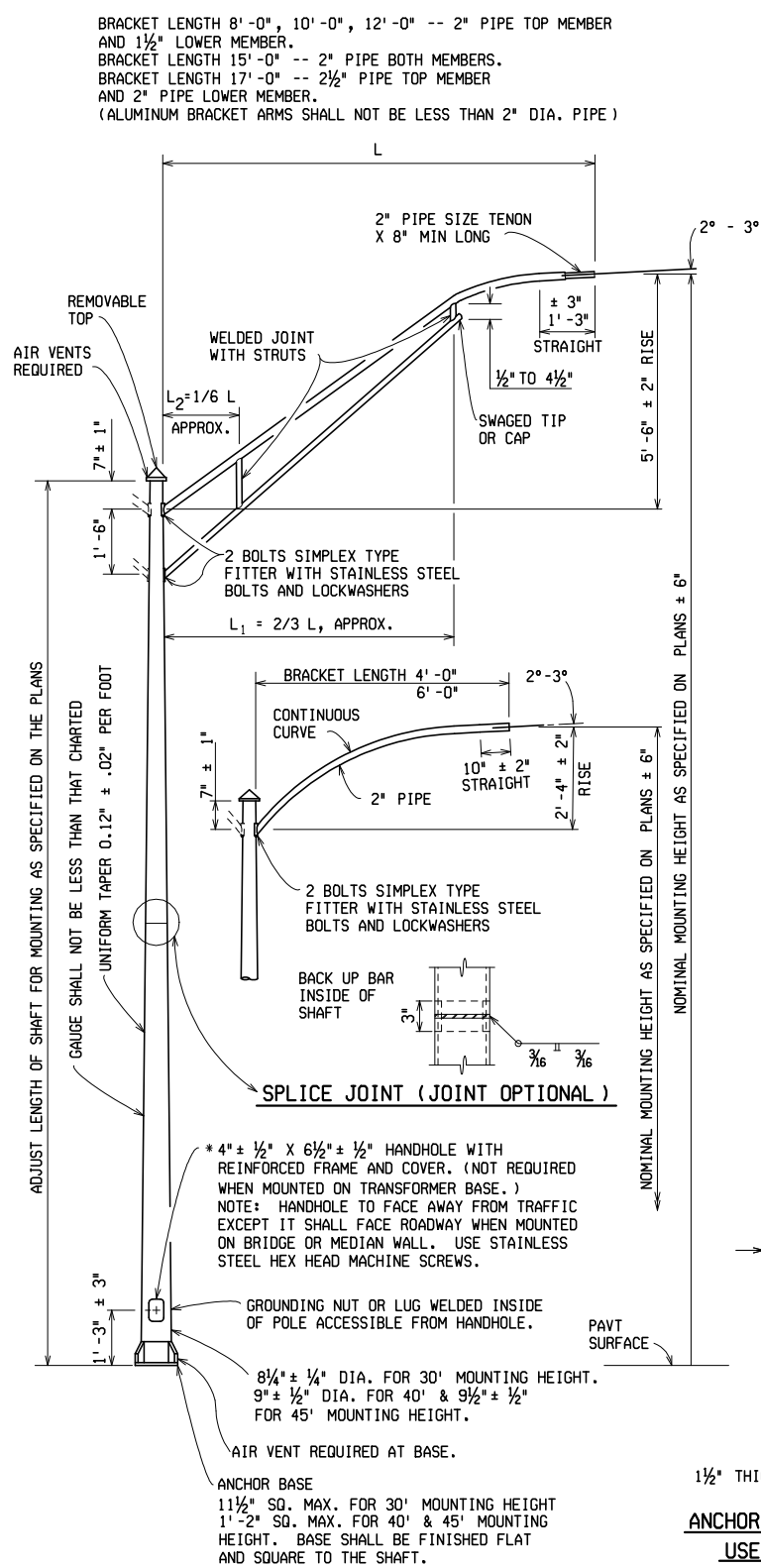


STREET LIGHTING ALTERATIONS 21-1

US-31 GRAND HAVEN				
DATE	CONT. SEC.	JOB NO.	DESIGN UNIT	SHEET NO.
04/12/07				R.O.W CONST.

FILE NAME: WORKED ON BY: DATE: CHECKED BY:

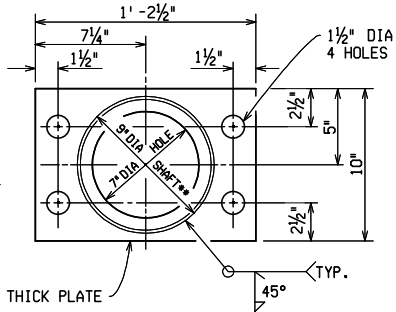
FINAL R.O.W.			
AUTH	DATE	NO.	REVISION



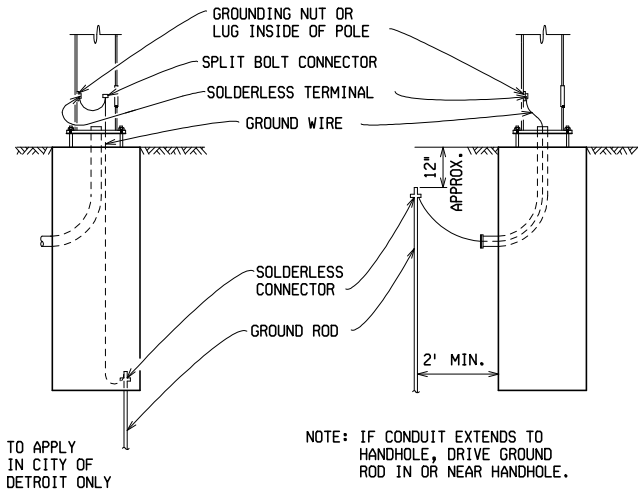
ANCHOR BASE PLAN

NOTES:

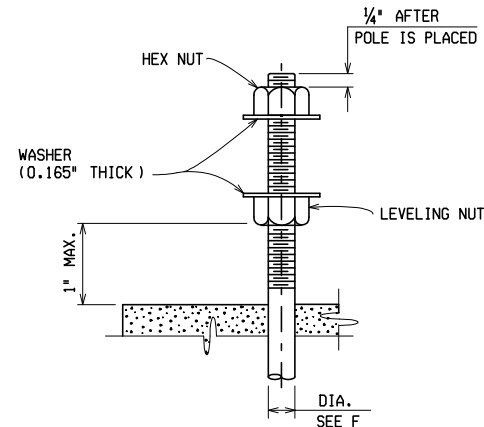
- ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE CURRENT MICHIGAN DEPARTMENT OF TRANSPORTATION SPECIFICATIONS FOR ELECTRICAL CONSTRUCTION.
- USE DETAIL "M" ANCHOR BOLTS. ANCHOR BOLT LENGTH "F" IS LENGTH BEFORE BENDING. FINAL STANDARD ADJUSTMENT SHALL BE LEVELED BY USE OF LEVELING NUTS.
- SUPPLY BRACKET ARM FITTERS FOR EACH ARM USED ONLY.
- STANDARD MOUNTED ON TRANSFORMER BASES SHALL HAVE THE SAME DIMENSIONS AS OTHER BASE TYPES, EXCEPT SHAFT LENGTH.
- USE SAME ANCHOR BOLTS FOR TRANSFORMER BASE AS FOR CORRESPONDING ANCHOR BASE TYPES.
- BOLT CIRCLE DIMENSION "A" FOR ANCHOR BOLTS MUST BE EXACT. ANCHOR BOLTS ARE TO BE SET TO A TEMPLATE.
- TOP OF FOUNDATION MUST EXTEND 1" MIN. OUTSIDE OF LIGHT STANDARD BASE.
- IF FOUNDATION IS WITHIN 30 FEET OF HANDHOLE, CONDUIT MAY BE RUN DIRECTLY TO HANDHOLE.
- WHEN ALUMINUM TRANSFORMER BASE IS USED, SUPPLY ¼" ELASTOMERIC FABRIC BOUND PAD FOR MOUNTING BETWEEN FRANGIBLE TRANSFORMER BASE AND FOUNDATION.
- ANCHOR BOLTS SHALL BE THREADED 1 INCH MORE THAN THE BOLT PROJECTIONS LISTED UNDER ITEM "E" IN THE TABLE ON THIS SHEET.
- ANCHOR BOLTS GREATER THAN 1 INCH SHALL USE 8UN THREADS
- WHEN A FRANGIBLE BASE IS CALLED FOR ON THE PLANS, NO LEVELING NUT IS TO BE USED, FRANGIBLE BASES SHALL BE MOUNTED FLUSH WITH TOP OF FOUNDATION.



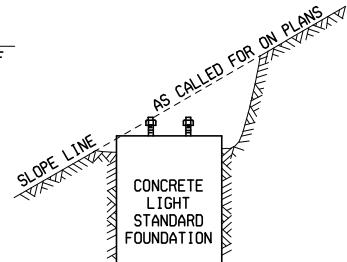
ANCHOR BASE DETAIL FOR LIGHT STANDARDS USED ON 10" TOP CONCRETE BARRIER



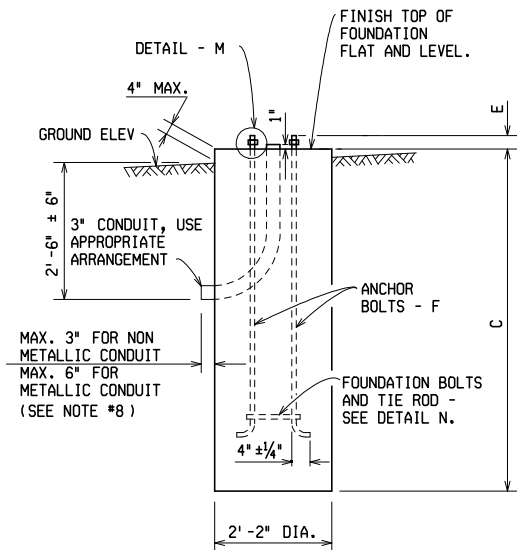
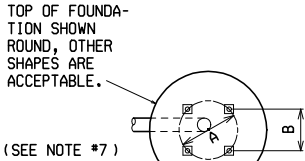
LIGHT STANDARD GROUNDING DETAIL



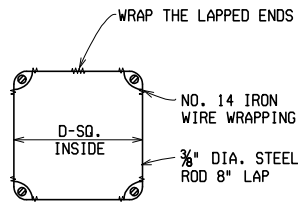
DETAIL - M



FOUNDATION DETAIL (ON FILL OR CUT SLOPE)



TYPICAL LIGHT STANDARD FOUNDATION




DETAIL - N

ANCHOR BOLTS AND TIE ROD

LIGHT STANDARD FOR	A	B	C	D	E	E FRANGIBLE BASE	STEEL POLES GA. (MIN.)	F	MINIMUM ANCHOR BASE THICKNESS	ALUM. POLES MIN. SHAFT THICKNESS
30 FT. MOUNTING HEIGHT WITH 4 OR 6 FT. SINGLE OR DOUBLE BRACKET ARM.	11"	7¾"	5'-0"	8¾"	4⅝"	2⅝"	11	1" Ø X 3'-4"	1"	.188"
30 FT. MOUNTING HEIGHT WITH 8,10,12 FT. SINGLE OR DOUBLE BRACKET ARM.	11"	7¾"	6'-0"	8¾"	4⅝"	2⅝"	11	1" Ø X 5'-0"	1"	.188" SGL.ARM .219" DBL.ARM
30 FT. MOUNTING HEIGHT WITH 15 FT. SINGLE OR DOUBLE BRACKET ARM.	11"	7¾"	6'-0"	8¾"	4⅝"	2⅝"	7	1" Ø X 5'-0"	1"	.188" SGL.ARM .219" DBL.ARM
30 FT. MOUNTING HEIGHT WITH 17 FT. SINGLE OR DOUBLE BRACKET ARM.	11"	7¾"	6'-0"	9"	5¼"	3"	7	1¼" Ø X 5'-0"	1⅞"	.188" SGL.ARM .219" DBL.ARM
40 & 45 FT. MOUNTING HEIGHT WITH 4,6,8,10,12,15,17 FT. SINGLE OR DOUBLE BRACKET ARM.	1'-1"	9¼"	8'-6"	10¾"	5½"	3¼"	11 GA. UP TO 15' BKT.ARM 7 GA. FOR 15' & 17' BKT.ARM	1¼" Ø X 5'-0"	1⅞"	.219" LOWER SECTION .188" UPPER SECTION

TYPICAL LIGHT STANDARD DESIGN

* THE HANDHOLES SHALL BE PLACED SO THEY DO NOT INTERSECT THE LONGITUDINAL SEAM WELD ON THE POLE.

 Michigan Department of Transportation	LIGHT STANDARD DETAILS				
	DATE	CONT. SEC.	JOB NO.	DESIGN UNIT	SHEET NO.
	04/12/07				R.O.W CONST.

DATE:

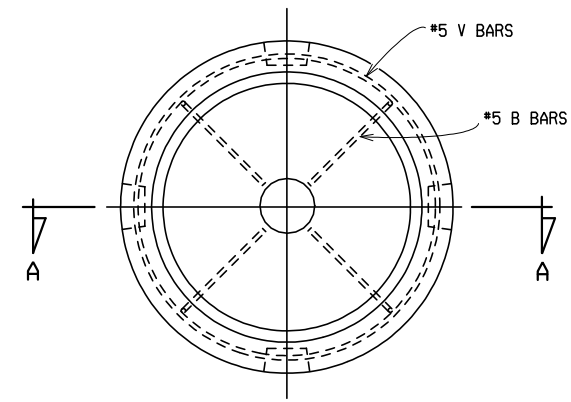
WORKED ON BY:

DATE:

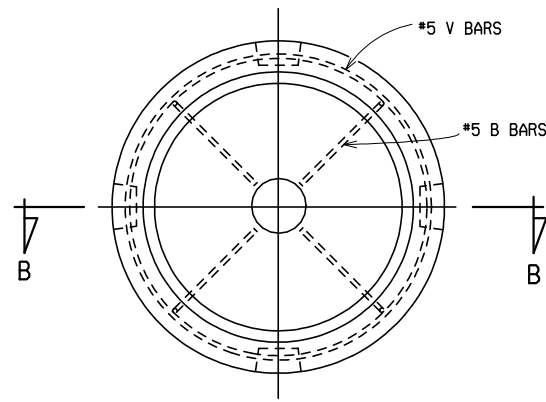
CHECKED BY:

FILE NAME:

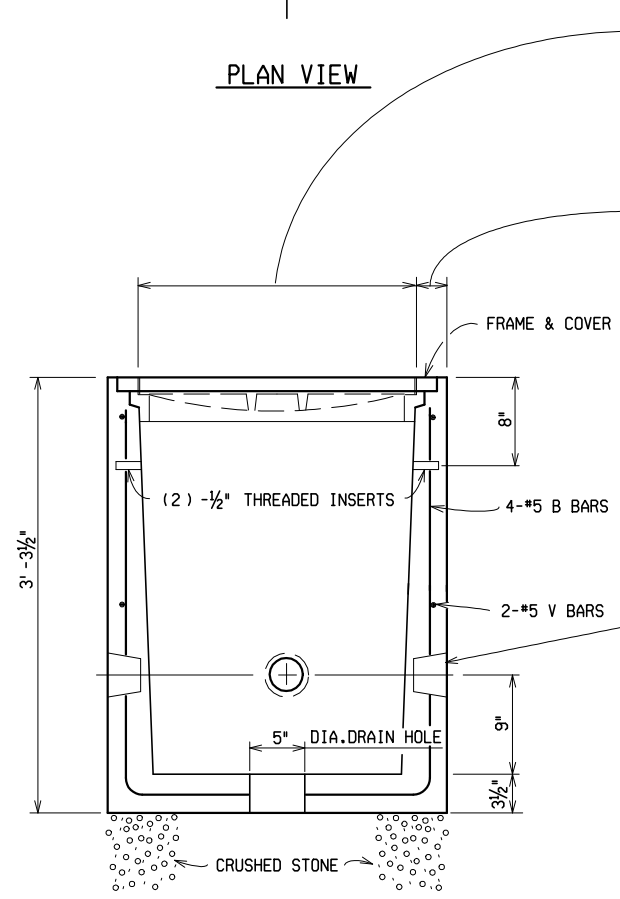
FINAL R.O.W.			
AUTH	DATE	NO.	REVISION



PLAN VIEW



PLAN VIEW



SECTION A-A PRECAST CONCRETE HANDHOLE

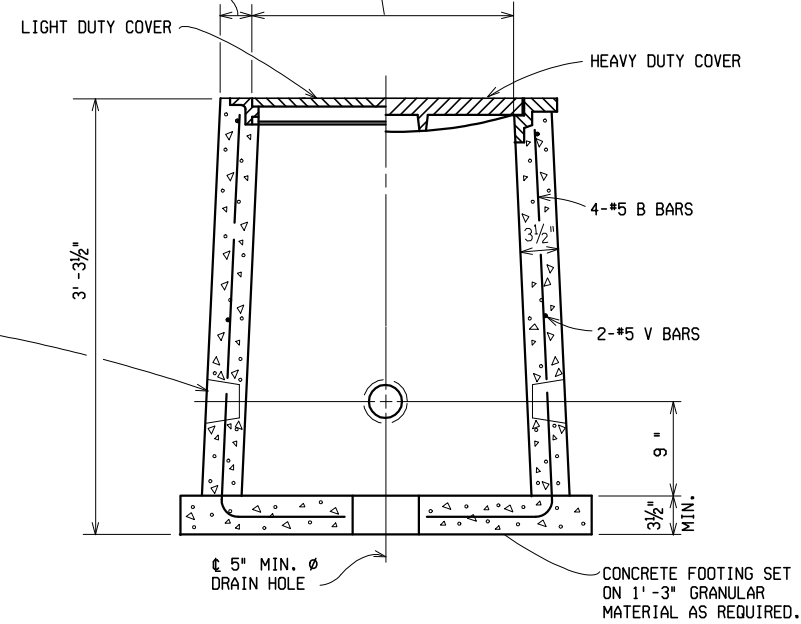
OPENING
18" FOR LIGHT DUTY COVER
24" FOR HEAVY DUTY COVER

FRAME
FRAME & COVER
SEE MATERIAL NOTES

WALL THICKNESS
MIN. WALL THICKNESS FOR LIGHT
DUTY COVER - 2 3/4", FOR HEAVY
DUTY COVER - 3 1/2". SHOULD THE
WALL BE TAPERED, A 0.3"/FT.
SLOPE SHALL BE USED.

STEEL REINFORCEMENT
REINFORCEMENT SHALL BE #5 BARS AS
SHOWN OR AN EQUIVALENT AREA OF
STEEL USING WELDED WIRE MESH.

ENTRANCE HOLES AS REQUIRED
FOR 3" & 4" CONDUIT.
ADDITIONAL OPENINGS SHALL BE
PROVIDED AS REQUIRED. HOLES
MAY BE DRILLED IN THE FIELD.



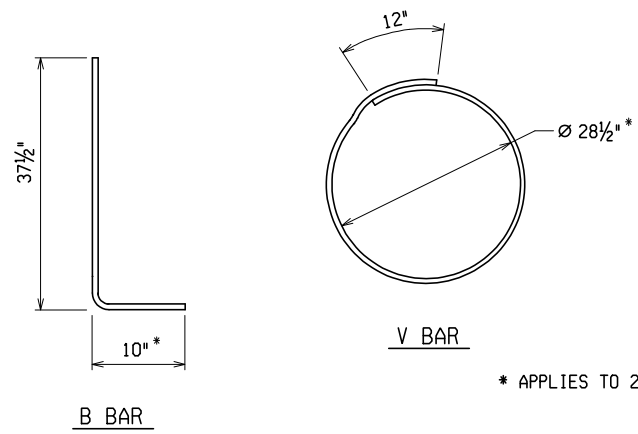
SECTION B-B PRECAST CONCRETE HANDHOLE

GENERAL NOTES:

- THE MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE CURRENT M.D.O.T. STANDARD SPECIFICATIONS.
- THE CONTRACTOR MAY CONSTRUCT THE HANDHOLE STRUCTURE OF CONCRETE MASONRY, OR OF PRECAST REINFORCED CONCRETE.
- THE INNER SURFACE OF THE HANDHOLE SHALL BE SMOOTH.
- ALL CASTINGS SHALL BE CLEANED BY SAND BLASTING.
- THE SEATING FACE OF THE COVER AND THE SEAT FOR THE COVER ON THE FRAME IF REQUIRED, SHALL BE GROUND OR MACHINED SO THAT THE COVER SHALL HAVE AN EVEN BEARING ON ITS SEAT TO PREVENT ROCKING OR TILTING.
- THE CASTINGS SHALL BE FREE OF POURING FAULTS, BLOW HOLES, CRACKS, AND OTHER IMPERFECTIONS. THEY SHALL BE SOUND, TRUE TO FORM AND THICKNESS, CLEAN AND NEATLY FINISHED AND SHALL BE COATED WITH COAL TAR PITCH VARNISH.
- HANDHOLE SHALL BE EQUIPPED WITH CABLE RACK AND HOOKS TO TRAIN CABLE.
- LIGHT DUTY COVER SHALL BE BOLTED TO FRAME WITH NOT LESS THAN 2 COUNTERSUNK HEX HEAD BRONZE BOLTS.
- PRECAST HANDHOLE WITH HEAVY DUTY COVER SHALL BE SET ON A CONCRETE SLAB .

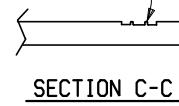
MATERIAL NOTES:

- HEAVY DUTY COVERS SHALL BE CASTINGS WHICH MEET THE REQUIREMENTS OF THE CURRENT SPECIFICATIONS FOR GRAY IRON CASTINGS ASTM DESIGNATION A48 AND SHALL HAVE A MINIMUM STRENGTH AS PROVIDED FOR CLASS NO. 30B GRAY IRON CASTINGS.
- ALL CONCRETE MASONRY SHALL BE GRADE 30M.
- THE HEAVY DUTY COVER & FRAME SHALL BE EAST JORDAN IRON WORKS #2860 TYPE "A" OR NEENAH FOUNDRY #R-6052 D FOR CIRCULAR COVER OR AN APPROVED EQUAL.
- LIGHT DUTY COVER AND FRAME SHALL BE EAST JORDAN IRON WORKS #2982A-18 OR NEENAH FOUNDRY #R-6012 D FOR CIRCULAR COVER OR AN APPROVED EQUAL.

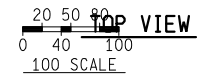
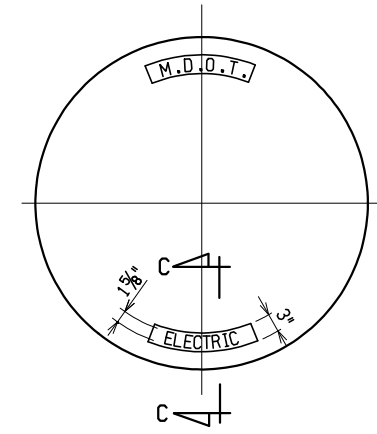



* APPLIES TO 24" HANDHOLE

ALL LETTERING TO BE 1/4" HIGH
AND FLUSH WITH SURFACE OF COVER



SECTION C-C



 Michigan Department of Transportation	ELECTRIC HANDHOLE DETAILS				
	DATE	CONT. SEC.	JOB NO.	DESIGN UNIT	SHEET NO.
	04/12/07				R.O.W CONST.

21-3

DATE: WORKED ON BY: DATE: CHECKED BY: FILE NAME: